

### ABSTRACT OF THE DISCLOSURE

Traveling-wave optoelectronic wavelength conversion is provided by a monolithic optoelectronic integrated circuit that includes an interconnected traveling-wave photodetector and traveling-wave optical modulator with a widely tunable laser source. Either parallel and series connections between the photodetector and modulator may be used. An input signal modulated onto a first optical wavelength develops a traveling wave voltage on transmission line electrodes of the traveling-wave photodetector, and this voltage is coupled via an interconnecting transmission line of the same characteristic impedance to transmission line electrodes of the traveling-wave optical modulator to modulate the signal onto a second optical wavelength derived from the tunable laser. The traveling wave voltage is terminated in a load resistor having the same characteristic impedance as the photodetector and modulator transmission lines. However, the interconnecting transmission lines and the load resistor may have different impedances than the photodetector and modulator.

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